REMARKS

The applicants appreciate the Examiner's thorough examination of the application and request reexamination and reconsideration of the application in view of the preceding amendments and the following remarks.

The Examiner rejects claims 19, 22-33, 35 and 36 under 35 U.S.C. §102(b) as being anticipated by *Park et al. Biosensors and Bioelectronics, Vol. 13* (hereinafter *Park et al.*). Additionally, the Examiner rejects claims 19 and 22-37 under 35 U.S.C. §103(a) as being unpatentable over *Park et al.*in view of *Qu et al.* (Analyicaa Chimica) or *He et al.* (Talanta) (hereinafter *Qu et al.* and *He et al.*). The Examiner also rejects dependent claims 34 and 37 under 35 U.S.C. §103(a) as being unpatentable over *Park et al.*, and dependent claims 20 and 21 under 35 U.S.C. §103(a) as being unpatentable over *Park et al.* in view of European Patent Application EP 0215 669 to *Karube et al.* (hereinafter *Karube et al.*). The Examiner also rejects dependent claims 20 and 21 under 35 U.S.C. §103(a) as being unpatentable over *Park et al.* in view of *Qu et al.* or *He et al.* taken further in view of *Karube et al.*

The applicants' independent claim 1 as amended recites a pathogen detection system comprising a vessel for containing a culture medium and for the introduction of a sample to be tested and a bio-sensor including an array of bio-sensor elements permanently residing in the vessel. The bio-sensor has a coating for attracting at least one pathogen expected in the sample. A detection circuit is responsive to the bio-sensor for indicating the presence of a pathogen on the bio-sensor. An electrical connection between the bio-sensor and the detection circuit links the bio-sensor to the detection circuit, and there is a seal between the vessel and the electrical connection for sealing the vessel.

THE CITED REFERENCES DO NOT DISCLOSE EACH AND EVERY ELEMENT OF THE APPLICANTS' CLAIMED INVENTION

Park et al. does not disclose an array of bio-sensor elements, as admitted by the Examiner, and thus does not anticipate the applicants' independent claim 19.

Additionally, *Park et al.* does not disclose that the bio-sensor is sealed in the vessel. The text of *Park et al.* does not use the word "seal". In Fig. 1 of *Park et al.*, the dip holder sandwiching the crystal is not shown completely in reaction cell "e", which is further evidence that it is not sealed within the reaction cell. Further support is provided by *Park et al.*'s description that the crystal is "dipped into a reaction cell". There is a difference between a crystal dipped into a reaction cell and a bio-sensor permanently residing in a vessel where there is a seal for sealing the vessel. *Park et al.* chose to describe the process and system in the former terms as opposed to the latter, which is further evidence that *Park et al.* does not teach the elements of the applicants' claims.

The Examiner also takes the position that *Park et al.*'s description of a dip holder seals the vessel. The applicants respectfully disagree. In this regard, the applicant has attached a copy of the pages of the website http://www. prodigital.com.au/917.html showing a type of quartz crystal analyzer (*Park et al.* discloses a quartz crystal microbalance analysis) as some evidence of concerning meaning of the term "plug" in the context of dip holders. The website lists components included in the quartz crystal analyzer, and these include an oscillator circuit unit, an AC connector (a 3 pin to 2 pin conversion plug) and a dip holder. The applicant has also attached a copy of web pages http://www.thermorussell.com/indk3.htm and http://www.thermorussell.com/cables.htm concerning pH electrodes, which describes dip electrodes, dip holders, and (electrical) plug types. These sources, especially combined with the

other indications as discussed above and previously, point toward *Park et al.* teaching a reaction cell into which a crystal is dipped but not sealed.

Anticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, arranged as in the claim. See e.g. Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick, 730 F.2d 1452, 221 USPQ 481, 485 (Fed. Cir. 1984).

Park et al. does not disclose the applicants' claimed elements arranged as in the applicants' claim 19, namely, a bio-sensor including an array of elements permanently residing in the vessel or a seal between the vessel and the electrical connection for sealing the vessel.

Accordingly, the applicants request that the Examiner withdraw the rejection of claim 19 based on *Park et al.*, as well as the rejection of claims 21-37 which depend directly or indirectly from claim 19.

Qu et al. and *He et al.* also not disclose an array of bio-sensor elements, as admitted by the Examiner, and thus the applicants' independent claim 19 is not anticipated by *Qu et al.* and *He et al.*

Independent claim 19 is also not obvious over the combination of *Park et al. and Qu et al.* or *He et al.* The Examiner states that *Qu et al.* and *He et al.* are cited to disclose "communicating a quartz crystal sensor within a culture vessel wherein a seal is provided between the vessel and an electrical connection (See Figure 1 of Qu et al. and Figure 1 of He et al.)".

However, neither *Qu et al.* nor *He et al.* (nor *Park et al.*, see above) use the word "seal" to describe the system set up, and Fig. 1 of both references show an element at the top of detection cell for which there is no description at all. There is no objective evidence of sealing,

and there is no evidence of a suggestion to combine these references.

THE CITED REFERENCES ARE NOT PROPERLY COMBINABLE

Broad conclusory statements regarding the teaching of multiple references, standing alone, is not evidence of a suggestion to combine references. See e.g. In re Dembiczak, 175 F.3d 994, 50 USPQ 2d 1614, 1617, abrogated on other grounds, In re Gartside, 203 F.3d 1305, 52 USPQ 2d 1769 (Fed. Cir. 2000).

In fact, there is evidence that the references cited by the Examiner do not suggest their combination.

Assuming *arguendo* that *Park et al.*, *Qu et al.* and *He et al.* disclose bio-sensors sealed within their respective vessels, the *Karube et al.* reference (cited by the Examiner as disclosing an array of bio-sensor elements) is not properly combinable with either *Park et al.*, *Qu et al.* or *He et al.*

A bio-sensor sealed in a vessel would destroy the functionality of *Karube et al.*'s system. *Karube et al.* teaches flow type cells into which various solutions are eluted and replaced with other solutions, and *Karube et al.* relies on these flows for the results obtained. See e.g. page 4, lines 45-48:

> ... the measurements of the frequency before and after an antigen-antibody reaction are carried out by replacing solutions with distilled water and feeding distilled water stored in a thermostatically controlled bath to the cell at a constant rate.

See also e.g. page 5, lines 10-18 and lines 39-47; page 6, lines 1-8, lines 16-19, lines 33-35, lines 52-54; page 7, lines 33-39, lines 58-59 and line 63.

Liquid circulation, including inlet and outlet pipes and valves are taught by *Karube et al.*

Thus, assuming for the sake of argument that *Park et al.*, *Qu et al.* and *He et al.* teach bio-sensors sealed in a vessel, the system taught by *Karube et al.* teaches away from a sealed system, and *vice versa*.

> Our case law makes clear that the best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine the references ...
>
> Combining prior art references without evidence of such a suggestion, teaching or motivation simply takes the inventor's disclosure as a blueprint for piecing together the prior art to defeat patentability – the essence of hindsight ...
>
> The range of sources available, however, does not diminish the requirement for actual evidence. That is, the showing must be clear and particular ... Broad conclusory statements regarding the teaching of multiple references, standing alone, are not "evidence".

See In re Dembiczak, 175 F.3d 994, 50 USPQ 2d 1614, 1617, abrogated on other grounds, In re Gartside, 203 F.3d 1305, 52 USPQ 2d 1769 (Fed. Cir. 2000) with citations and quotations omitted.

In summary, the cited references do not disclose, *inter alia*, a bio-sensor sealed in the vessel, and even assuming *arguendo* some of the cited references teach this element, there is no clear and particular showing that suggests combining these references with a reference which would not work if such an element were included.

The Examiner is not permitted to base a rejection on part of a reference if other parts of the reference are necessary to fully appreciate the teaching of the reference.

> It is impermissible within the framework of §103 to pick and choose from any one reference only so much as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art. See In re Hedges, 783 F.2d 1038, 228 USPQ 685, 687 (Fed. Cir. 1986) (citations omitted).

Karube et al. teaches and relies on a flow through system, in contrast to any system in which the bio-sensor is sealed within the vessel (including the sytems of *Park et al.*, *Qu et al.*, and *He et al.* if they are assumed for the sake of argument to teach a sealed system).

Moreover, *Qu et al.* teaches a technique depending on the change of conductivity and permittivity during the course of gelation. See e.g. *Qu et al.* Abstract and Conclusion. *Park et al.* teaches mass change at the crystal reflected by an increase or decrease in the crystal frequency. *He et al.* discusses a system where anti-E antibody was immobilized on the surface of a crystal and the piezoelectric resonant frequency shift due to the mass change caused by specific binding of the microorganisms to the surface is measured. *He et al.* then eschews and teaches away from such a system by teaching a system that relies on the fact that metabolizing bacteria change the chemical composition of the growth medium. The chemical changes cause an alteration in the impedance of the medium, and the total impedance alteration represents changes in conductance and permittivity of the medium. See, e.g. the *He et al.* Introduction.

Other than the knowledge of the applicants' invention, these cited references do not suggest their combination, especially given the diverse methodology taught by each of them.

The law is clear that the teaching of the desirability of combining the references must not come from the applicant's invention. "There must be a reason or suggestion in the art for selecting the procedure used, *other* than the knowledge learned from the applicants' disclosure." See In re Dow Chemical Company, 837 F. 2d 469,473, 5 U.S.P.Q.2d 1529, 1532 (Fed. Cir. 1989) (with emphasis added).

Identification in the prior art of each individual part claimed is insufficient to defeat patentability of the whole claimed invention. Rather, to establish obviousness based on a

combination of the elements disclosed in the prior art, there must be some motivation, suggestion or teaching of the desirability of making the specific combination that was made by the applicant. In re Kotzab, 217 F. 3d 1365, 1370, 55 USPQ2d 1313, 1316 (Fed.Cir. 2000).

Accordingly, for the reasons herein, the applicants request that the Examiner withdraw the rejections of claims 19 and 21-37 based on any combination of *Park et al.*, *Qu et al.*, *He et al.*, and/or *Karube et al.* Claim 20 has been cancelled.

The applicants' claimed invention offers an improvement over known systems by providing speed, accuracy, safety and convenience, the combination of which was previously needed but was lacking. The applicant's claimed invention allows continuous monitoring and instant detection of a pathogen in a culture medium, without the need to draw samples for testing, without the need to remove the bio-sensor, or to add solutions to the vessel during monitoring, or to contact the bio-sensor to other agents. Greater accuracy and increased safety result.

Finally, the applicants submit that no new search is necessary because the applicants have simply added elements from dependent claims to the independent claim, and Examiner has performed a search with respect to these elements as evidenced by the rejections of all of the claims.

CONCLUSION

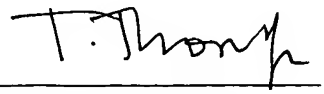
Accordingly, claims 19 and 21-37 are in condition for allowance.

Each of Examiner's have been addressed or traversed. Early and favorable action is respectfully requested.

If for any reason this Response is found to be incomplete, or if at any time it appears that

a telephone conference with counsel would help advance prosecution, please telephone the undersigned or his associates, collect in Waltham, Massachusetts at (781) 890-5678.

Respectfully submitted,



Thomas E. Thompkins, Jr.
Reg. No. 47,136

Model QCA917 Quartz Crystal Analyzer

Simultaneous Weight/Resonant Frequency and Electrochemical Measurements

* Track potential, current and frequency or admittance intensity simultaneously

* Sensitive enough to measure weight change in a monolayer

* Quantify elastic and viscous changes in your system

* Real time graphics of electrochemical activity using M270 Research Electrochemistry Software

* Front panel display of frequency and admittance

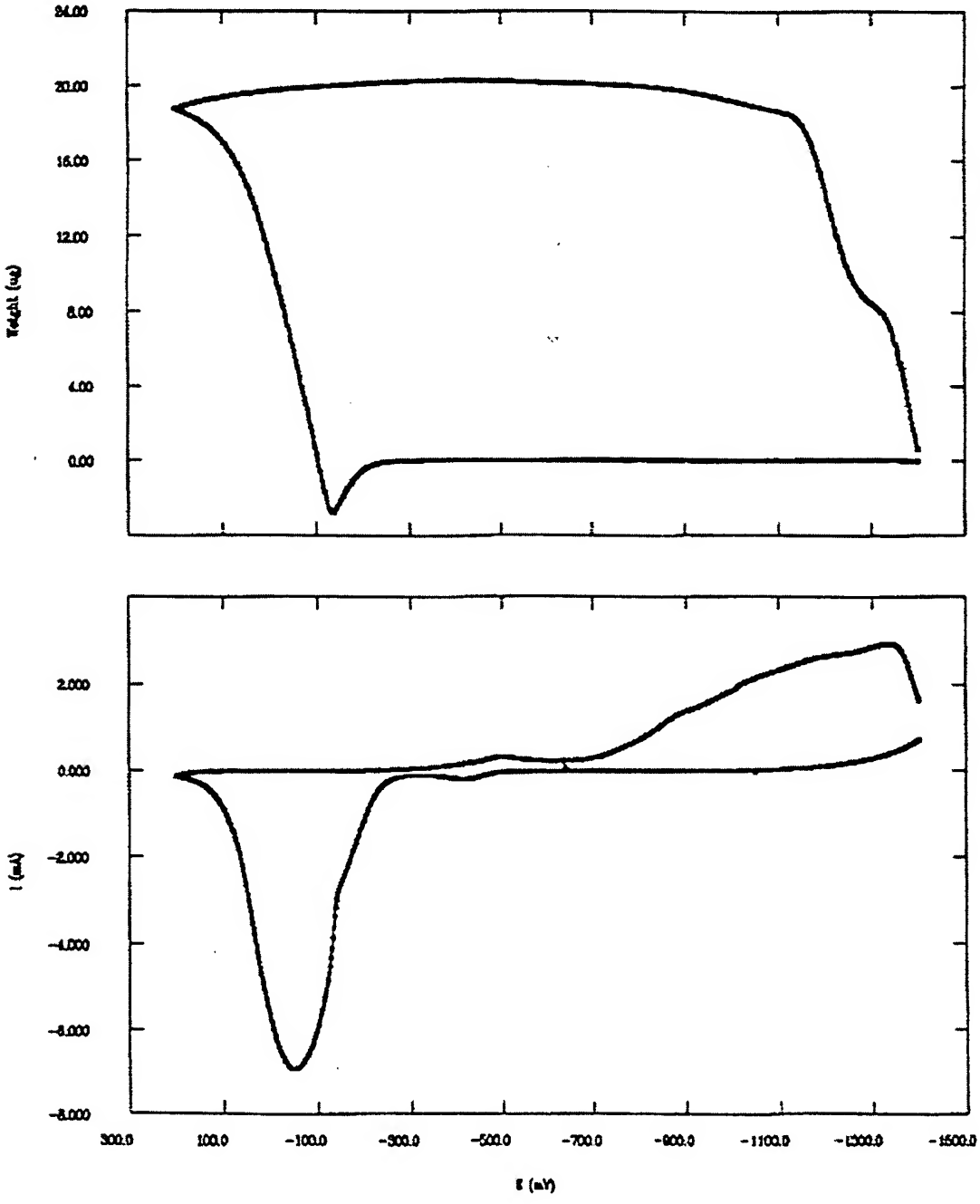
* Analog outputs for change in frequency and admittance

* Well- and dip-type crystal holders

Seiko EG&G and EG&G Instruments have joined forces to bring you the new QCAS17 Quartz Crystal Analyzer, It is designed to fully integrate with either the 283, 263A/98 or 273A research potentiostat and our world class Model 270 Research Electrochemistry software.

With the addition of a potentiostat, the Model QCASI7 will provide information on potential, current, resonant frequency (weight) and admittance intensity simultaneously. This allows researchers to detect the analysis of electrochemical deposition, polymers coated on electrodes, corrosion, adsorption and electrochemical reaction mechanisms.

Other application areas for the QCA917 are batteries, electroplating and biosensor development.



Current and weight (a frequency) for a voltammogram of Cu (plated on Pt) in 1 M NaOH

SPECIFICATIONS

Main Unit

Resolution: 0.1 Hz

Interfaces: IEEE-488 (GPIB),RS232C

Gate Time: Variable, (108/18/0.18)

Admittance Gain: Variable (low/medium/high)

Size: 215mm x 90mm x 230mm

Weight: 1.5 kg

Oscillating Unit

Size: 50 mm x 20 mm x 75mm

Weight: 60g

Temp: 0 to 400 C

Quartz Crystal

9 MHz AT-cut; Au or Pt sputtered electrode on Ti layer

Electrode Area: 0.2cm2

Electrode Thickness: Au or Pt approx. 3000A

Analog Outputs

delta f Output (proportional to electrode mass)

· 200 Hz

· 1 part in 4096 resolution update rate set by gate time0-5V fs

· 1 KOhm output impedance

Admittance Output

·1 part in 4096 resolution

· update rate set by gate time

· 0-10V fs

·1 KOhm output impedance

Software

Real Time electrochemical data via M250/270 software v. 4.1

Plot formats available

·Admittance vs. Potential

·Admittance vs. Current

· Admittance vs. Time

· Frequency vs. Potential

· Frequency vs. Current

· Frequency vs. Time

Specifications subject to change without notice

Ordering Information

The following components are included in the QCA917:

· Main Unit

· Oscillator circuit unit

· Oscillator unit cable

· Power supply cable

· AC connector (a 3 pin to 2 pin conversion plug)

· Working electrode terminal lead wire

· Well type quartz crystal holder

· 50 Resonators, quartz crystal (platinum electrode type)

Optional accessories:

* QA9RA-50 Resonators, Gold, pkg of 50

* QA9RP-50 Resonators, Platinum, pkg of 50

* QA-CL3 Dip Holder

* QA-CL4 Well Holder

Operated by: vinces@ozemail.com.au

Thermo
ELECTRON CORPORATION

industrial pH

industrial pH and ORP electrodes

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CWL/13.5/S7
Glass, gel filled combination pH electrode with 13.5 pg thread cap

Best for: Routine on-line and flowcell pH measurement

CWL/13.5/S7 - Screw cap

Click here for different lengths and diameter of cable

IGW722
Plastic, combination pH electrode for use with IDES holder

Best for:
Routine open vessel or open stream pH measurement

IGW722 - 2 x Tags, 6 metre cable
IGW79 - Clean ends, 6 metre cable
IGW711 - BNC, 6 metre cable

DIW722
Low maintenance, dip, combination pH electrode

Best for:
Routine open vessel or open stream pH measurement

DIW722 - One metre body, 2 x Tags, 6 metre cable
DIW79 - One metre body, clean ends, 6 metre cable
DIW711 - One metre body, BNC, 6 metre cable

Other body lengths (0.3 - 2.0 metre), plug types and cable lengths on request

DIPt22
Low maintenance, dip, combination ORP electrode

Best for:
Routine open vessel or open stream ORP measurement

DIPt22 - One metre body, 2 x Tags, 6 metre cable
DIPt9 - One metre body, clean ends, 6 metre cable
DIPt11 - One metre body, BNC, 6 metre cable

Other body lengths (0.3-2.0 metre), plug types and cable lengths on request

DISb22
Low mainten dip, anti combina pH elect

Best for
Industri measure in HF ar acidic fluoride

DISb22 metre b x Tags, metre ca DISb9 - metre b clean en metre ca DISB11 metre b BNC, 6 cable

Other b lengths (0.3-2.0 metre), types an cable le on requ

N.B. Antimo electrod the mV of pH controll ask The Electro assistan

Close-up of sensing tip

required, or click here to download our Antimony electrode data sheet.

CMPtBL/13.5/S7
Glass, gel filled combination ORP electrode with 13.5 pg thread cap

Best for: Routine online and flowcell ORP measurement

CMPtBL/13.5/S7 - Screw cap

Different lengths and diameters of cable available

IGPt22
Plastic, combination ORP electrode for use with IDES holder

Best for:
Routine open vessel or open stream ORP measurement

IGPt22 - 2 x Tags, 6 metre cable
IGPt9 - Clean ends, 6 metre cable
IGPt11 - BNC, 6 metre cable

specifications

Model	CWL/13.5/S7	CMPtBL/13.5/S7	IGW722	IGPt22	DIW722	DIPt22	DISb22
Temp range (°C)	0-80	0-80	0-60	0-60	0-60	0-60	0-60
Reference junction	Ceramic	Ceramic	Ceramic	Ceramic	Ceramic	Ceramic	Ceramic
Diameter (mm)	12	12	34	34	26	26	26

ordering information

IDES1000	PVC Dip holder for IG type electrode, 1 metre
IDES600	PVC Dip holder for IG type electrode, 0.6 metre
IDES300	PVC Dip holder for IG type electrode, 0.3 metre
IDES/PP/1054	Polypropylene Dip holder for high temperature applications, 1 metre
JUNC008	Replacement ceramic junctions for IDES holders, pack of three
S00K/1000	Reference electrolyte for IDES holders, one litre

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<< previous page 1 2 3

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Thermo ELECTRON CORPORATION

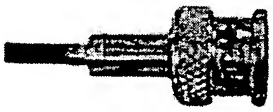
buffers, solutions, accessories

cables and connectors

Close this window

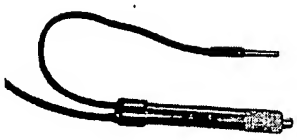
Almost all Thermo Electron electrodes are available with an integral fixed cable or with a screw cap. Screw cap electrodes require a separate cable for connection to a meter. Part numbers for screw cap electrodes are designated by an L. Please refer to the illustrations below to choose the correct plug termination for the cable. The digits at the end of the part number are the plug type for cables and for electrodes with fixed cables. E.g. KCWL = screw cap electrode, CLSCH11 = cable for screw cap electrodes with BNC plug, KCW11 = electrode with fixed cable and BNC plug, KCW6 = electrode with fixed cable and DIN plug. Cables are 3mm in diameter and one metre in length unless otherwise stated. Any other cable length or plug type on request.

cables for laboratory combination electrodes

CLSCH11	Cable with screw cap electrode connector and BNC plug. Used on most modern pH meters including Russell, Orion, Mettler, Fisher, Denver, Hanna, Jenway, Corning.	
CLSCH11/3M	Three meter cable with screw cap electrode connector and BNC plug.	
CLSCH11/5M	Five meter cable with screw cap electrode connector and BNC plug.	
CLSCH11/10M	Ten meter cable with screw cap electrode connector and BNC plug.	
CLSCH6	Cable with screw cap electrode connector and DIN 19262 plug. Used on some German/Swiss pH meters including some WTW, Schott, Knick, Metrohm.	
CLSCH57	Cable with screw cap electrode connector and Radiometer No. 7 plug. Used on Radiometer meters.	
CLSCH8	Cable with screw cap electrode connector and UK TV coaxial plug. Used on old pH meters including some Philips, Pye,	

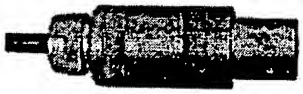
E.I.L., Griffin.

CLSCH4 — Cable with screw cap electrode connector and US Standard Pattern plug. Used on old pH meters including some Orion, Corning, Beckman.

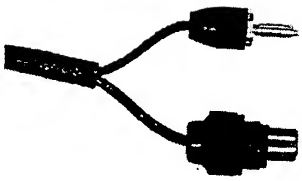


CLSCH124 — Cable with screw cap electrode connector and 5mm Lemo plug. Used on some Metrohm titrators.

CLSCH122 — Cable with screw cap electrode connector and 8mm Lemo plug. Used on some Metrohm titrators.

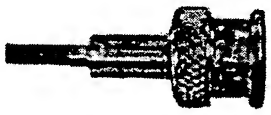


CLSCH2 — Cable with screw cap electrode connector and coaxial/wander plug. Used on some old Pye, Philips.



cables for sensing half cells

SLSCH11 — Cable with screw cap electrode connector and BNC plug.



SLSCH124 — Cable with screw cap electrode connector and 5mm Lemo plug.

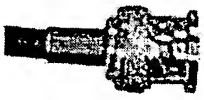
cables for laboratory reference electrodes

RLSCH4 — Cable with screw cap electrode connector and 2mm pin plug.

RLSCH5 — Cable with screw cap electrode connector and 4mm pin plug.

cables for industrial electrodes

CLSCH11/5mm — Industrial (5mm) cable with BNC plug.



CLSCH11/5mm/3M — Three metre industrial (5mm) cable with BNC plug.

CLSCH11/5mm/6M — Six metre industrial (5mm) cable with BNC plug.

CLSCH9/5mm — Industrial (5mm) cable with clean finished ends.

CLSCH9/5mm/3M	Three metre industrial (5mm) cable with clean finished ends.
CLSCH9/5mm/6M	Six metre industrial (5mm) cable with clean finished ends.
CLSCH22/5mm	Industrial (5mm) cable with tags.
CLSCH22/5mm/3M	Three metre industrial (5mm) cable with tags.
CLSCH22/5mm/6M	Six metre industrial (5mm) cable with tags.

adapters

A/11S-06P	Adaptor for BNC plug electrode to DIN socket meter
A/11S-08P	Adaptor for BNC plug electrode to co-axial socket meter
A/11S-04P	Adaptor for BNC plug electrode to USA pattern socket meter
A/11S-124P	Adaptor for BNC plug electrode to 5mm LEMO socket meter

Any other adapter available on request, please mention meter and electrode model numbers.

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tel: +44 (0)1337 828871 **e-mail: sales.water.uk@thermo.com** **fax: +44 (0)1337 828972**

IANDIORIO & TESKA

INTELLECTUAL PROPERTY LAW ATTORNEYS

Joseph S. Iandiorio
Kirk Teska
Jason D. Shanske
Thomas E. Thompkins, Jr.
Roy J. Coleman
David W. Poirier

260 BEAR HILL ROAD
WALTHAM, MASSACHUSETTS 02451-1018

Tel: (781) 890-5678
Fax: (781) 890-1150
e-mail: admin@iandiorio.com
web: www.iandiorio.com

June 22, 2005

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

SUBJECT:	Applicant:	Houston et al.
	Serial No.:	10/080,053
	Filed:	February 21, 2002
	For:	SMART CULTURE VESSEL
	Group:	1744
	Examiner:	Beisner, W.H.
	Docket No.:	DR-332J

Dear Sir:

Enclosed is a RESPONSE in reply to the Final Office Action mailed May 18, 2005 in the subject application.

If for any reason this RESPONSE is found to be INCOMPLETE, or if at any time it appears that a TELEPHONE CONFERENCE with counsel would help advance prosecution, please telephone the undersigned or his associates, collect in Waltham, Massachusetts at (781) 890-5678.

If any payment during prosecution is found to be incorrect, please charge any deficiency or credit any overpayment to my Deposit Account No. 09-0002. A copy of this letter is enclosed for use by the Finance Branch in the event that it is necessary to make any charge or credit to my deposit account.

In addition, pursuant to Rule 1.136(a)(3), the Office is hereby authorized to treat any reply requiring an extension of time as incorporating a request therefor. Also, any request or Petition for an Extension of Time notwithstanding an inadvertent reference in the Petition to a shorter period of time is to be treated as requesting the appropriate length of time.

Kindly acknowledge receipt of the foregoing by returning the enclosed self-addressed postcard.

Sincerely,

T. Thomp

Thomas E. Thompkins, Jr.
Reg. No. 47,136

TET:ok
Enclosures

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the U.S. Postal Service with sufficient postage as first class mail in an envelope addressed to Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on June 22, 2005.

Olga Kadish

Olga Kadish